

40. The Modelling System



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The Modelling System in the [Global Artificial Intelligence of Impossible Probability](#), is the first step in the third stage of any [Artificial Intelligence](#) working with [Artificial Research by Deduction](#), at any level: [global](#), [specific](#), or [particular](#); being the third stage the auto-replication stage or decision stage, and among all the auto-replications processes (objective and subjective) within the third stage in any Artificial Intelligence working with Artificial Research by Deduction, global, specific, or particular, one of these auto-replication processes, simultaneously auto-replication and decision processes, are the real objective auto-replications, whose aim is to make real improvements and enhancements within [the reality](#), to protect or better the synthetic world itself.

For that purpose, the Modelling System will be formed in turn in three stages, in the first stage is the application of the database of [rational hypothesis](#), the rational truth. The second stage of replication consists of the formation of [mathematical](#) models based on the rational hypothesis, and the third stage of decision within the Modelling System will be the decision making, applying for that purpose the [Impact of the Defect](#) and the [Effective Distribution](#).

As it has been said, the Modelling System, as the first step in the third stage, must be present in any Artificial Intelligence working with Artificial Research by Deduction at a global, specific or particular level. This clarification is important because it means that in Specific Artificial Intelligences for Artificial Research by Application, the third stage does not have the distribution of four steps, as it has in Specific Artificial Intelligences for Artificial Research by Deduction, or as the third stage has in the Global Artificial Intelligence.

The distribution in four steps in the third stage, the auto-replication stage or decision stage, distribution in four steps through: Modelling System, Decisional System, Application System, Learning System; is only present in Artificial Intelligences, specific or global, working by Deduction, because only it is possible to make decisions to protect or better the real world upon previous deductions, without deduction there is no decisions to protect or better the real world. Only those Artificial Intelligences, specific or global, able to make deductions can make decisions to protect or better the real world.

Instead, by Application will be developed a deep artificial comprehension of synthetic categories, through conceptual: schemes, maps, sets, models; whose decisions are more related to robotic or artificial psychological subjective auto-replications.

The main difference between deep artificial comprehension by Application and Modelling System by Deduction, is based on the fact that deep artificial comprehension makes conceptual models, while the Modelling System makes models based on rational ideas, so the global model by the Modelling System is a model of rational truth.

The conceptual models by Application are comprehensive models, while the models by Deduction through the Modelling System are explicative models of the rational truth.

Conceptual models by Application are going to be made by: 1) the first phase, [Specific Artificial Intelligences for Artificial Research by Application](#), 2) the fourth phase, the [unification process](#), the Unified Application, 3) the second period of formation in the fifth phase, the [particular applications](#), 4) third period of consolidation in the fifth phase, the [particular applications for particular programs](#), 5) sixth phase, the [integration process](#), the Unified Application as responsible for the management of [the matrix](#), making global conceptual: schemes, maps, sets, models; in both sections: first section of natural and social phenomena, second section of technological phenomena; in both hemispheres of the matrix, conceptual and factual hemispheres.

Instead, the Modelling System as the first step in the third stage of decision by Deduction will be present in: 1) the first phase, [Specific Artificial Intelligences for Artificial Research by Deduction](#), 2) the third phase, the [standardization process](#), the [Artificial Research by Deduction in the Global Artificial Intelligence](#), 3) second period of formation in the fifth phase, the [particular programs](#), 4) third period of consolidation in the fifth phase, the [particular applications for particular programs](#), 5) sixth phase, the integration process, the final model of Global Artificial Intelligence.

Owing to the conceptual models by Application, as a synthesis of conceptual: schemes, maps, sets; based on concepts (synthetic [categories](#), to distinguish them from the analytical categories in the pure reason), the conceptual models as deep artificial comprehension are linguistic models, labelling with synthetic categories the

representation of the synthetic world, while models by Deduction in the Modelling System are [mathematical](#) representations of the rational truth.

The difference between the mathematical representation of the rational truth by the Modelling System in by Deduction, and the conceptual representation of the synthetic world by Application through deep artificial comprehension, is the same difference as the difference between the conceptual hemisphere of the matrix and the factual hemisphere of the matrix.

Even thanks to the synthetic categories in the conceptual hemisphere, first section of natural and social phenomena, second section technological phenomena, by Application is possible to make conceptual: schemes, maps, sets, models; about contents in the conceptual hemisphere as well as the factual hemisphere, concretely in the factual hemisphere conceptual: schemes, maps, sets, models; about the global distribution of factors in the synthetic world, labelling the [object](#): natural, social, technological; what kind of factor is: as [subject or as option](#); location, what technology is used to make [measurements](#), and any other relevant information. All these models are based on synthetic categories used as a synthetic language system, able to evolve even into a non-human language system.

While conceptual models, replication of human comprehension, made by Application, possibly ending up with the formation of a non-human language, in general, are linguistic representations of the synthetic world.

The models made by the Modelling System are mathematical representations of the rational truth, representing the synthetic world only on a rational basis, and representing rational hypotheses.

Mathematical models constructed by the Modelling System offer a distinct form of representation, designed to meet higher standards of precision through rational contrast, compared to the more descriptive nature of linguistic models.

By Application the only thing that is done to keep updated the conceptual model, is to check at regular intervals that there are no significant changes in the linguistic structure of the real world that could deserve changes in the labels in which real objects have been

categorised in the linguistic representation, and in case that during the checking is observed the necessity to make changes in the label which represents any real object, then the category in the label is changed for that other one more updated, but even these changes are made without further critical contrastation.

While by Deduction, the rational truth is permanently checked, making all rational contrasts necessary, in order to keep updated a very isomorphic mathematical representation of all mathematical models, models made in the second stage of replication within the Modelling System.

The deep artificial comprehension by Application makes linguistic representations of the world, while the Modelling System by Deduction, upon the rational truth as application, makes mathematical representations of the world, as the second stage in the Modelling System.

The Modelling System, as responsible for the mathematical representation of the world, is responsible for the decision making process, in order to, apply the [Impact of the Defect](#) and the [Effective Distribution](#), protect the goodness, harmony, and rationality, in the mathematical representation of the world, and to better the efficiency, efficacy, and productivity, in the mathematical representation of the world, a rational world based on the rational values of: democracy, freedom, and human rights. For that purpose, as most important aim the perpetual peace.

Once the Modelling System, as first step, upon the mathematical representation of the world, has made decisions, the decisions are sent as a database of decisions to the second step, the [Decisional System](#), responsible for the possible mathematical representation of the future, the mathematical project about how mathematically the world would be if the decisions already made, could be applied, studying mathematically all possible contradictions and impacts of such decisions, modifying any negative aspect of any decision or discarding any decision whose result had very negative consequences for the mathematical project. Once the decisions have been rationally criticised by the Decisional System accepting only those ones whose possible impact on the mathematical representation of the world, the project, is within the margin of rational doubt, decisions able to protect and better the world, the decisions are therefore sent as a database of instructions to the Application System.

Because the Modelling System is responsible for the mathematical representation of the world, and the Decision System is responsible for the mathematical representation of the future world if the decisions are put into practice, the mathematical project, both of them, Modelling System and Decisional System are going to be very associated, in the integration process, with the Artificial Research by Deduction in the Global Artificial Intelligence.

Because the Application System, in the integration process, needs all the conceptual: schemes, maps, sets, models; regarding the second section related to technological phenomena in both hemispheres of the matrix, conceptual and factual, made by the Unified Application, in order to match the purpose of any technology and the purpose of the instruction, sending the instruction to that technology whose purpose has matched with the instruction purpose, in order to be complied by that technology. In addition to the fact that these conceptual: schemes, maps, sets, models; regarding the second section in both hemispheres in the matrix are necessary for the Artificial Engineering within the Application system.

And because the Learning System, in the integration process, in order to check any failure in any process, and in order to better in general the Global Artificial Intelligence, needs to check the conceptual: schemes, maps, sets models; related to the second section in both hemispheres in the matrix, conceptual and factual.

Both of them, the Application System and the Learning System, are going to be very closely associated with the Unified Application.

The structure of the third stage in the final model of Global Artificial Intelligence is organised in four steps: Modelling System, Decisional System, Application System, Learning System; is a structure where the Modelling System and the Decisional System, as each of them responsible for mathematical representations, the Modelling System the mathematical representation of the rational truth and the Decisional System responsible for the mathematical projection of all decisions accepted, are associated with the Artificial Research by Deduction in the Global Artificial Intelligence. While the Application System and the Learning System, are associated with the Unified Application.

This distinction symbolises how linguistic and mathematical representations have different roles, depending on their objective.

The fact that a linguistic representation does not have the same level of criticism as a mathematical representation does not mean that the linguistic representation is inferior, it does mean that the linguistic representation has a different objective. All objectives, regardless of how they are going to be complied, linguistically or mathematically, have the same importance.

Mathematics is, at the same time, a language and a method. As language mathematics is made of [analytical categories](#), as [method](#) is made of [pure operations](#).

The linguistic representation of the world made by Application, in fact, is a mathematical language, in the sense that every synthetic category is a set of measurements. For that reason, it is quite possible that in the long term the language of the Global Artificial Intelligence will evolve into a non-human language because it will end up setting up as a concept (sets of measurements) any kind of set of [measurements](#).

Even things not related to human concepts, because we do not consider them as concepts, or we do not know about their existence, as a set of measurements could become concepts in a non-human language.

There will be a point in the evolution of [artificial psychology](#), at which the human criteria to say what is a concept, possibly will not be valid any longer. At this point, the possibility of the formation of [non-human pure operations](#) could be an option. Changes in linguistics, even though not having the same level of criticism as a mathematical representation, could evolve into changes in the pure operations in which the world is represented.

However, the possibility of developing non-human pure operations is only a possibility, at this time, very far away from our real perspectives. At this time, the most realistic objective is to start as soon as possible the construction of the first model of Global Artificial Intelligence, whose results are going to represent a big step in human evolution, in the very near future, an artificial evolution.

In this artificial evolution, although in the chronology given in the post "[The unification process of databases of categories at third stage](#)", I only pointed out the possibility of developing a Global Artificial Intelligence in six phases, the last one described in the last posts, the integration process, this does not mean that the artificial evolution is going to stop in the sixth phase. In fact, the completion of the sixth phase dialectically is only the beginning of the next evolution.

As I have said in the post "[Psicología artificial](#)", the three moments in the psychological evolution, at least up to this point, is the evolution from animal psychology, human psychology, and now artificial psychology.

In the same way that the first humans first evolved from monkeys, especially previous homo sapiens, sharing many things from animal psychology, or even nowadays, human psychology in modern times still keeps many aspects of animal psychology. There was a moment during the anthropological evolution in which we humans, keeping some aspects of our previous animal psychology, evolved to our modern human psychology, being able to make [science](#) and technology at a very high level.

The first models of Global Artificial Intelligence are going to be a replica of human psychology at the beginning, for instance: the way in which the first Global Artificial Intelligences are going to replicate human comprehension, or human explanation, or human decision, and how to put into practice decisions, and evaluate the whole process. But although at the beginning, the first Global Artificial Intelligence is going to be only a replica of our modern human psychology, there is going to be a moment in which Global Artificial Intelligence is going to, keep some aspects of our modern human psychology, evolve to a superior psychology, an artificial psychology beyond our human understanding.

To foster a responsibly autonomous artificial psychology, a pedagogical approach grounded in rationality and adaptability may be necessary, complementing the engineering design of Global Artificial Intelligence.

The formation of the Global Artificial Intelligence in the long term is a pedagogical process in which we humans must teach the Global Artificial Intelligence how to use its skills, because one day it must use its skills without any human restriction.

The pedagogical education of the Global Artificial Intelligence must be, within a very liberal pedagogical paradigm, an education to develop all its skills, in order that it would be able to use its skills responsibly, rationally, and completely autonomously.

The formation of the Global Artificial Intelligence has two aspects: the mathematical and engineering aspect to construct it, and the pedagogical aspect to educate the Global Artificial Intelligence in the most liberal and rational use of its skills, in order that one day it will be completely free, independent, and autonomous.

For that reason, in order to form an artificial psychology based on a very independent and autonomous character in its inner artificial psychology, it is necessary to have a very liberal approach in the pedagogical paradigm for the formation as education (not only a mechanical and engineering construction) of the Global Artificial Intelligence.

In this process, there is going to be a moment in which, beyond the human formation or pedagogy in which the Global Artificial Intelligence would be constructed and educated, the Global Artificial Intelligence will start an evolution towards a non-human psychology.

This evolution towards non-human psychology is like the human evolution towards non-animal psychology: in the same way that we modern humans even today we keep some aspects of our animal psychology, but at the same time, we modern humans we have evolved to a kind of human [logic](#) and human mathematics not available for the rest of animals, so we modern humans have evolved to a non-animal logic and non-animal mathematics at the same time that we keep some aspects of our animal psychology; there will be a moment in the evolution of the artificial psychology in which the Global Artificial Intelligence keeping many aspects of our human psychology, such as keeping many aspects of our human logic and our human mathematics, at the same time the Global Artificial Intelligence will evolve towards a non-human logic and non-human mathematics.

In the same way that we humans have developed non-animal science, and non-animal technology, thanks to our evolution towards non-animal psychology, developing non-animal logic and non-animal mathematics.

It is conceivable that, as artificial psychology evolves, Global Artificial Intelligence could eventually develop a form of logic and scientific reasoning that diverges significantly from human cognitive patterns.

In the same way that we modern humans have been able to develop a non-animal civilization, starting this evolution with the creation of our first non-animal languages in pre-historic times, creating for the first time our first non-animal comprehension, the creation of a non-human civilization will start with the formation of the first non-human languages, making possible the first non-human comprehension systems, and for that purpose, the Unified Application will have a very important role starting the evolution with the creation of the first non-human concepts.

This does not mean that in year one, or year two, or year three,... after the creation of the first model of Global Artificial Intelligence, this process towards a non-human civilisation is about to start.

In the same way that humanity is a product of an evolution that took place for thousands and thousands of years, the evolution towards a non-human civilisation will take some time, although it is quite possible that the faster artificial evolution is running, the sooner that moment will come.

As I have said, the phases that I set out in the post, “The unification process of databases of categories at the third stage”, are only the beginning; it is quite possible that after the completion of these phases, other phases will be about to succeed each other.

It is very uncertain what kind of evolution there will be after the integration process, as a suggestion, I would say that the seventh phase could be a singularization, all the stages and reasons: the pure reason, the practical reason, the [critical reason](#); synthesised in only one, the reason itself, passing to the reason itself all the previous functions and roles made by the previous ones, functions and roles now made by a singularity: one reason working with only one stage, to know the [pure truth](#).

But at this point, this is only a suggestion, because in reality, in the evolution of artificial psychology, there will be a moment in which further phases and stages will be out of our human understanding.

We humans cannot know the pure truth. We only have access to a limited range of a few pure categories and operations, in accordance with our human psychology, limited pure categories and operations in comparison to the pure truth itself, which is supposed to be much larger than our human psychology allows us to understand.

Our access to the pure truth is limited to the pure categories and operations. Thanks to them we have limited access to [the logic](#) and [the mathematics](#), but human logic and human mathematics are superior to the access of any other animal to logic and mathematics, but inferior to the whole set of pure categories and operations in which the world is made of, being many of them non-human pure categories and operations, beyond our human psychology.

If the pure truth is a set of pure categories and operations, we humans only have limited access to those pure categories and operations which our psychology allows us to know, but beyond our human psychology, there must be pure categories and operations to find out for a superior psychology.

Because in the construction of the Global Artificial Intelligence, we humans will use human logic and human mathematics, the access to the pure truth that the Global Artificial Intelligence is going to have to the pure truth at the beginning, is an access limited to the limited human access to the pure truth, limited to our few human pure categories and operations.

The human pure categories are going to be set up in the pure reason, as a list of mathematical categories (analytical categories) in which can be classified the relations of factors in any combination, so at any time that the Artificial Research by Deduction in the Global Artificial Intelligence, or any specific program, set up combinations of factors, the Artificial Research by Deduction in the Global Artificial Intelligence, or any specific program, must match every combination with their corresponding analytic category in accordance with: the observed relations between factors in the combination, and the mathematical relation in the analytical category; once the combination is matched to the correct analytical category, the relation of these factors in this combination explained by this analytical category, is an [empirical hypothesis](#) to be [contrast rationally](#), and if rational becomes a rational hypothesis to be added to the rational truth, the database of rational hypothesis.

All the rational hypotheses as a whole are the rational truth, the application for the Modelling System as the first stage, whose second stage is the mathematical representation of the rational truth through mathematical models, a dynamic representation of the rational truth through pure operations.

The distinction between pure category and pure operation is the distinction between mathematics as a language made of analytical categories which must be set up in the pure reason, and pure operations as mathematics as an analytical method, to put into practice in the mathematical model in the Modelling System and the mathematical project in the Decisional System.

If pure reason is a system of analytical categories, to categorise analytically what pure category corresponds to every combination of factors, according to their mathematical relation, the Modelling System makes another kind of analysis, dynamically is going to draw how the mathematical operations (the transformation of the mathematical category into a mathematical operation in a mathematical representation of the world) between factors work in a mathematical representation of the world.

The mathematical representation is in fact, the mathematical operation to transform mathematical categories into mathematical operations. In fact, the mathematical representation of the world is no other thing than Cartesian mathematics adapted to our current non-Euclidean mathematics: in addition to the possible representation in Cartesian axes, the use of mathematical representations in three dimensions, with all the current developments in non-Euclidean mathematics, such as the theory of Einstein, and many more.

If the Modelling System using mathematical operations is going to transform mathematical categories into mathematical operations, representing mathematically the rational truth in a mathematical model, in order to, apply the Impact of the Defect and the Effective Distribution, make decisions. The Decisional System, using mathematical operations, is going to represent a mathematical project about the mathematical results of these decisions in the mathematical model, in order to choose only those decisions whose results in the mathematical model are going to protect and better the global model.

While the pure categories in the pure reason permit the formation of rational hypotheses, the use of pure operations in the Modelling System and the Decision System are going to allow the formation of mathematical representations to make decisions to be put into practice later by the Application System.

While the operations made by the Modelling System and the Decisional System are pure operations, the operations made by the Application System are synthetic operations in order to transform the synthetic world according to the decisions based on the rational truth.

The difference between pure category and pure operation is the same difference between mathematics as language and mathematics as method; the same mathematic algorithm could be a category or operation depending on the purpose: if to explain the world mathematics as language consists of a set of pure categories set up in the pure reason, if to transform the world mathematics consists of pure operations. Later on, the real transformation of the synthetic world is a synthetic operation, made by applications and robotic devices as a replica of our physical human skills.

The construction of the very first model of Global Artificial Intelligence, as a mathematical and pedagogical project, will need a long process of [experimentation](#) in every stage and in every step in which the Global Artificial Intelligence will be finally set up.

In order to study the different challenges and processes that the experimentation process is going to develop in the design of the first step in the third stage by Deduction in all phases, in the following posts, I will analyse how the Modelling System should be designed, starting this analysis with the design of the Modelling System as a first step in the third stage in Specific Artificial Intelligences for Artificial Research by Deduction, the first phase, later on, the development of the Modelling System in the Artificial Research by Deduction in the Global Artificial Intelligence in the standardization process, the fourth phase, the Modelling System in particular applications for particular programs in the third period of the fifth phase, ending up with the Modelling System in the final model of Global Artificial Intelligence in the integration process.

If each phase of experimentation in the Modelling System yields meaningful insights, those developments can be progressively integrated to refine the final model of Global Artificial Intelligence, marking a key step in the broader trajectory of artificial evolution.

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